



**BILLING CODE 3510-22-P**

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**RIN 0648-XE251**

**Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Implementation of a Test Pile Program in Anchorage, Alaska**

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Notice; issuance of an incidental harassment authorization.

**SUMMARY:** In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that we have issued an incidental harassment authorization (IHA) to the Municipality of Anchorage (MOA) Port of Anchorage (POA) to incidentally harass four species of marine mammals during activities related to the implementation of a Test Pile Program, including geotechnical characterization of pile driving sites, near its existing facility in Anchorage, Alaska.

**DATES:** This authorization is effective from April 1, 2016, through March 31, 2017.

**FOR FURTHER INFORMATION CONTACT:** Robert Pauline, Office of Protected Resources, NMFS, (301) 427-8401.

**SUPPLEMENTARY INFORMATION:**

**Availability**

An electronic copy of POA's application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at:

[www.nmfs.noaa.gov/pr/permits/incidental/construction.htm](http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm). In case of problems accessing these

documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**).

## **Background**

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the U.S. can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Section 101(a)(5)(D) establishes a 45-day time limit for NMFS' review of an application followed by a 30-day public notice and comment period on any proposed authorization for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny the authorization. Except with respect to

certain activities not pertinent here, the MMPA defines "harassment" as “any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].”

### **Summary of Request**

On February 15, 2015, NMFS received an application from POA for the taking of marine mammals incidental to conducting a Test Pile Program as part of the Anchorage Port Modernization Project (APMP). POA submitted a revised application on November 23, 2015. NMFS determined that the application was adequate and complete on November 30, 2015. POA proposes to install a total of 10 test piles as part of a Test Pile Program to support the design of the Anchorage Port Modernization Project (APMP) in Anchorage, Alaska. The Test Pile Program will also be integrated with a hydroacoustic monitoring program to obtain data that can be used to evaluate potential environmental impacts and meet future permit requirements. All pile driving is expected to be completed by July 1, 2016. However, to accommodate unexpected project delays and other unforeseeable circumstances, the requested and proposed IHA period for the Test Pile Program is for the 1-year period from April 1, 2016, to March 31, 2017. Subsequent incidental take authorizations will be required to cover pile driving under actual construction associated with the APMP.

The use of vibratory and impact pile driving is expected to produce underwater sound at levels that have the potential to result in behavioral harassment of marine mammals. Species with the expected potential to be present during the project timeframe include harbor seals (*Phoca vitulina*), Cook Inlet beluga whales (*Delphinapterus leucas*), and harbor porpoises

(*Phocoena phocoena*). Species that may be encountered infrequently or rarely within the project area are killer whales (*Orcinus orca*) and Steller sea lions (*Eumetopias jubatus*).

## **Description of the Specified Activity**

### *Overview*

We provided a description of the proposed action in our **Federal Register** notice announcing the proposed authorization (80 FR 78176; December 16, 2015). Please refer to that document; we provide only summary information here.

The POA is modernizing its facilities through the APMP. Located within the MOA on Knik Arm in upper Cook Inlet (See Figure 1-1 in the Application), the existing 129-acre Port facility is currently operating at or above sustainable practicable capacity for the various types of cargo handled at the facility. The existing infrastructure and support facilities were largely constructed in the 1960s. They are substantially past their design life, have degraded to levels of marginal safety, and are in many cases functionally obsolete, especially in regards to seismic design criteria and condition. The APMP will include construction of new pile-supported wharves and trestles to the south and west of the existing terminals, with a planned design life of 75 years.

An initial step in the APMP is implementation of a Test Pile Program, the specified activity for this IHA. The POA proposes to install a total of 10 test piles at the POA as part of a Test Pile Program to support the design of the APMP. The Test Pile Program will also be integrated with a hydroacoustic monitoring program to obtain data that can be used to evaluate potential environmental impacts and meet future permit requirements. Proposed Test Pile Program activities with potential to affect marine mammals within the waterways adjacent to the POA include vibratory and impact pile-driving operations in the project area.

### *Dates and Duration*

In-water work associated with the APMP Test Pile Program will begin no sooner than April 1, 2016, and will be completed no later than March 31, 2017 (1 year following IHA issuance), but is expected to be completed by July 1, 2016. Pile driving is expected to take place over 25 days and include 5 hours of vibratory driving and 17 hours of impact driving as is shown in Table 1. A 25 percent contingency has been added to account for delays due to weather or marine mammal shut-downs resulting in an estimated 6 hours of vibratory driving and 21 hours of impact driving over 31 days of installation. Restriking of some of the piles will occur two to three weeks following installation. Approximately 25 percent of pile driving will be conducted via vibratory installation, while the remaining 75 percent of pile driving will be conducted with impact hammers. Although each indicator pile test can be conducted in less than 2 hours, mobilization and setup of the barge at the test site will require 1 to 2 days per location and could be longer depending on terminal use. Additional time will be required for installation of sound attenuation measures, and for subsequent noise-mitigation monitoring. Hydroacoustic monitoring and installation of resonance-based systems or bubble curtains will likely increase the time required to install specific indicator pile from a few hours to a day or more.

Within any day, the number of hours of pile driving will vary, but will generally be low. The number of hours required to set a pile initially using vibratory methods is about 30 minutes per pile, and the number of hours of impact driving per pile is about 1.5 hours. Vibratory driving for each test pile will occur on ten separate days. Impact driving could occur on any of the 31

days depending on a number of factors including weather delays and unanticipated scheduling issues. On some days, pile driving may occur only for an hour or less as bubble curtains and the containment frames are set up and implemented, resonance-based systems are installed, hydrophones are placed, pipe segments are welded, and other logistical requirements are handled.

**Table 1- Conceptual Project Schedule for test pile driving, including estimated number of hours and days for pile driving**

Month	Pile Type	Pile Diameter	Number of Piles	Number of Hours, Vibratory Driving	Number of Hours, Impact Driving	Number of Days of Pile Driving	Number of Days of Restrikes	Total Number of Days of Pile Driving
April – July 2016	Steel pipe	48" OD	10	5	17	21	4	25
				+ 25% contingency =				
				6 hours	21 hours	26 days	5 days	31 days

Notes: OD – outside diameter.

### *Specific Geographic Region*

The Municipality of Anchorage (MOA) is located in the lower reaches of Knik Arm of upper Cook Inlet. The POA sits in the industrial waterfront of Anchorage, just south of Cairn Point and north of Ship Creek (Latitude 61°15' N., Longitude 149°52' W.; Seward Meridian). Knik Arm and Turnagain Arm are the two branches of upper Cook Inlet and Anchorage is located where the two Arms join (Figure 2-1 in the Application).

### **Comments and Responses**

A notice of NMFS' proposal to issue an IHA was published in the **Federal Register** on December 16, 2015 (80 FR 78176). During the 30-day public comment period, the Marine

Mammal Commission (Commission) and Friends of Animals (FoA) each submitted letters. The Center for Biological Diversity (CBD) and The Humane Society of the U.S. (HSUS) submitted comments jointly. The letters are available at [www.nmfs.noaa.gov/pr/permits/incidental/construction.htm](http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm). NMFS' responses to submitted comments are contained below.

*Comment 1:* The Commission, FoA, and CBD/HSUS recommended that NMFS defer issuance of incidental take authorizations and regulations until it has better information on the cause or causes of the ongoing decline of beluga whales and has a reasonable basis for determining that authorizing takes by behavioral harassment would not contribute to further decline.

*Response:* In accordance with our implementing regulations at 50 CFR 216.104(c), NMFS uses the best available scientific information to determine whether the taking by the specified activity within the specified geographic region will have a negligible impact on the species or stock and will not have an unmitigable adverse impact on the availability of such species or stock for subsistence uses. Based on currently available scientific evidence, NMFS determined that the impacts of the Test Pile Program would meet these standards. Moreover, POA proposed and NMFS required a comprehensive mitigation plan to reduce impacts to Cook Inlet beluga whales and other marine mammals to the lowest level practicable.

Our analysis utilizing best available information indicates that issuance of this IHA is not expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival. The ESA Biological Opinion determined that the issuance of an IHA is not likely to jeopardize the continued existence of the Cook Inlet beluga whales or destroy or adversely modify Cook Inlet beluga whale critical habitat. Based on the

analysis of potential effects and the conservative mitigation and monitoring program, NMFS determined that the activity would have a negligible impact on the population.

As additional research is conducted to determine the impact of various stressors on the Cook Inlet beluga whale population, NMFS will incorporate any findings into future negligible impact analyses associated with incidental take authorizations.

*Comment 2:* The Commission recommended that NMFS develop a policy that sets forth clear criteria and/or thresholds for determining what constitutes small numbers and negligible impact for the purpose of authorizing incidental takes of marine mammals.

*Response:* NMFS is in the process of developing both a clearer policy to outline the criteria for determining what constitutes “small numbers” and constructing an improved analytical framework for determining whether an activity will have a “negligible impact” for the purpose of authorizing takes of marine mammals. We fully intend to engage the MMC in these processes at the appropriate time.

*Comment 3:* The Commission recommended that NMFS draft and finalize its programmatic environmental impact statement (PEIS) on the issuance of incidental take authorizations in Cook Inlet and establish annual limits on the total number and types of takes that are authorized for sound-producing activities in Cook Inlet. FoA wrote that NMFS should prepare an environmental impact statement before issuing any IHAs.

*Response:* NMFS published a **Federal Register** Notice of Intent to Prepare a programmatic EIS for Cook Inlet (79 FR 61616; October 14, 2014). We are continuing the process of developing the PEIS and will consider the potential authorization of take incidental to sound producing activities. The PEIS is meant to address hypothetical increasing future levels of activity in Cook Inlet which, cumulatively, may have a significant impact on the human



environment. In the interim, NMFS is evaluating each activity individually, taking into consideration cumulative impacts, with an EA, to determine if the action under consideration can support a Finding of No Significant Impact (FONSI). For this IHA, NMFS determined that the Test Pile Program will not have a significant impact on the human environment, as specified in its FONSI.

*Comment 4:* The Commission recommended that NMFS adopt a consistent approach when determining the potential number of takes of beluga whales in Cook Inlet for future incidental take authorization applications regarding sound-producing activities.

*Response:* While NMFS strives for consistency where appropriate, it is important to note that there are a number of acceptable methodologies that can be employed to estimate take. Some methodologies may be more or less suitable depending upon the type, duration, and location of a given project. Furthermore, there may be available data that are applicable only within a localized area and not across the entirety of Cook Inlet. As such, NMFS makes determinations about the best available information, including the most appropriate methodologies to generate take estimates, on an action-specific basis.

*Comment 5:* The Commission recommended that NMFS require POA to implement delay and shut-down procedures if a single beluga or five or more harbor porpoises or killer whales are observed approaching or within the Level B harassment zones for impact and vibratory pile driving, as has been done under recent IHAs that involved the use of airguns and sub-bottom profilers for seismic surveys, or provide sufficient justification regarding why implementation of those procedures is not necessary for the proposed activities.

*Response:* NMFS, after engaging in consultation under section 7 of the ESA, has modified the Level B harassment shutdown requirement that was in the proposed IHA. Rather

than shutdown for groups of five or more belugas or calves observed within or approaching the maximum potential Level B harassment zones (1,359 m and 3,981 m for impact and vibratory pile driving, respectively), the IHA will require a more stringent shutdown measure. POA must shut-down upon observation of a single beluga whale within or approaching the maximum potential Level B harassment zones when driving unattenuated piles, and within a modified zone when piles are driven using sound attenuation systems. See “Mitigation” for more details of this shutdown requirement.

As described in the notice of proposed authorization, NMFS will not require POA to shut down if five or more harbor porpoises or killer whales are observed approaching or within the Level B harassment zones for impact and vibratory pile driving. The assumed benefit of such a measure is not well understood, and shutting down during these rare occurrences risks seizing of the pile, in which the pile becomes stuck in the substrate. This may result in loss of 10% of the total data from the Test Pile Program and 100% of the data from the seized pile, which would greatly reduce the Program’s usefulness. Depending on which pile seized it could represent complete data loss for a certain sound attenuation treatment type (i.e. encapsulated bubble curtain and adBM resonance system). Since this data will be helpful to both POA and NMFS in the future to help assess impacts of future actions and inform development of mitigation that could have conservation value, NMFS does not want to risk losing this potentially valuable data.

*Comment 6:* FoA commented that NMFS is in violation of the Marine Mammal Protection Act (MMPA) since that FoA believes large numbers of beluga whales will be harassed and that significant non-negligible impacts to whales will occur. CBD/HSUS commented that the small numbers analysis and negligible impact determination were deficient.

*Response:* NMFS utilized the best available scientific evidence to determine whether the taking by the specified activity will have a negligible impact on the species or stock. NMFS determined that the impacts of the Test Pile Program would meet these standards. See the *Analysis and Determinations* section on *Negligible Impact Analysis* later in this Notice. Similarly, the Biological Opinion determined that the issuance of an IHA is not likely to jeopardize the continued existence of the Cook Inlet beluga whales or destroy or adversely modify Cook Inlet beluga whale critical habitat. Moreover, NMFS has required as part of the IHA a rigorous mitigation plan to reduce potential impacts to Cook Inlet beluga whales and other marine mammals to the lowest level practicable.

Finally, we determined the Test Pile Program would take only small numbers of marine mammals relative to their population sizes. The number of belugas likely to be taken represents less than ten percent of the population. Some of these takes may represent single individuals experiencing multiple takes. In addition to this quantitative evaluation, NMFS has also considered the seasonal distribution and habitat use patterns of Cook Inlet beluga whales and rigorous mitigation requirements to determine that the number of beluga whales likely to be taken is small. See the *Analyses and Determinations* section later in this document for more information about the negligible impact and small numbers determinations for beluga whales and other marine mammal species for which take has been authorized.

*Comment 7:* FoA and CBD/HSUS noted that the proposed activities would impact beluga habitat which is considered Type 1 or high value/high sensitivity habitat. FoA is also concerned that if pile driving is not completed by July of 2016, the project's activities could overlap with the time period with the largest annual beluga presence.

*Response:* The section on *Anticipated Effects on Habitat* found later in this notice describes in detail how the ensonified area during the Test Pile Program represents less than 1% of designated critical habitat in Area 1. Furthermore, the POA and adjacent navigation channel were excluded from critical habitat designation due to national security reasons (76 FR 20180, April 11, 2011).

Although POA has requested that a one-year authorization period running from April 1, 2016 through March 31, 2017, POA intends to complete all Test Pile Program activities prior to July 1, 2016. If the Program extends beyond that date, note that NMFS' analysis and determination of authorized take levels are conservative in that they are based on the density of beluga whales during the summer months when concentrations are higher. Even though POA plans to start in spring and finish early summer, should pile driving extend past July 1, the take estimates presented here would likely be conservative. Therefore, continuation of planned pile driving beyond July 1, 2016 would not affect our determinations.

*Comment 8:* NMFS stated that no apparent behavioral changes have been observed when belugas were sighted near construction activities including pile driving and dredging in Cook Inlet. As such, CBD/HSUS urged NMFS to obtain data on behavioral modifications in order to properly conduct its negligible impact determination. Furthermore, FoA noted that any effects may not always be visible to the naked eye or visible at all (e.g. internal injury). FoA stated that NMFS has not adequately accounted for the high mobility of beluga whales or unpredictability of being able to adequately observe these animals when the agency evaluated POA's request for an IHA and its mitigation and monitoring measures. FoA recommends that NMFS should do so before proceeding in making its decision.

*Response:* Available data describing behavioral impacts associated with marine noise is limited in several ways according to Southall *et al.* 2007. Insufficient data exist to support criteria other than those based on SPL alone, and this metric fails to account for the duration of exposure beyond the difference between pulse and non-pulse sounds. Additionally, there is much variability in responses among species of the same functional hearing group and also within species. Because of the influences of numerous variables, behavioral responses are difficult to predict given present information. Furthermore, any biological significance of an observed behavioral response is extremely difficult to assess (NRC, 2005). Additional research is needed to quantify behavioral reactions of a greater number of free-ranging marine mammal species to specific exposures from different human sound sources. This is an area of increasing interest and as new data becomes available NMFS will incorporate this information into future assessments.

NMFS also understands that observing every beluga whale that enters into the zones of influence may not be possible given the large size of the maximum potential vibratory pile driving Level B harassment zone (3,981 m). However, piles driven using sound attenuation systems are expected to have much smaller Level B harassment zones (approximately 300-900 m; see “Mitigation” for further detail). Additionally, POA will employ a robust monitoring program which will include marine mammal observers (MMOs) in an elevated platform and personnel on hydroacoustic monitoring vessels. MMOs will have been trained in identifying changes in behavior that may occur due to exposure to pile driving activities. Furthermore, Level A harassment (injury) is not anticipated to occur due to the shutdown protocols required of POA. Given this information NMFS is confident POA can reliably monitor beluga whales in the zones of influence and identify and record behavioral impacts.

*Comment 9:* FoA noted that anthropogenic noises can result in masking hindering the ability of whales to communicate. FoA also noted that anthropogenic activities can result in noise that can provoke temporary threshold shift (TTS) or permanent threshold shift (PTS) while NMFS stated in the proposed authorization that no marine mammals have been shown to experience TTS or PTS as a result of pile driving activities.

*Response:* NMFS acknowledged in the proposed **Federal Register** notice that masking may occur due to anthropogenic sounds occurring in frequency ranges utilized by beluga whales. NMFS, however, believes that the short-term duration and limited affected area would not result in significant impacts from masking. NMFS wrote that although no marine mammals have been shown to experience TTS or PTS as a result of being exposed to pile driving activities, captive bottlenose dolphins and beluga whales exhibited changes in behavior when exposed to strong pulsed sounds (Finneran *et al.*, 2000, 2002, 2005). The animals tolerated high received levels of sound before exhibiting aversive behaviors. Experiments on a beluga whale showed that exposure to a single watergun impulse at a received level of 207 kPa (30 psi), which is equivalent to 228 dB, resulted in a 7 and 6 dB TTS in the beluga whale at 0.4 and 30 kHz, respectively. Thresholds returned to within 2 dB of the pre-exposure level within four minutes of the exposure (Finneran *et al.*, 2002). Although the source level of pile driving from one hammer strike is expected to be much lower than the single watergun impulse cited here, animals exposed for a prolonged period to repeated hammer strikes could receive more sound exposure in terms of SEL than from the single watergun impulse (estimated at 188 dB re 1  $\mu\text{Pa}^2\text{-s}$ ) in the aforementioned experiment (Finneran *et al.*, 2002). However, in order for marine mammals to experience TTS or PTS, the animals have to be close enough to be exposed to high intensity sound levels for a prolonged period of time. Based on the best scientific information available,

NMFS finds that with mitigation protocols in place, including a 100 meter shut-down zone, sound pressure levels (SPLs) that marine mammals might reasonably be anticipated to experience as part of the Test Pile Program are below the thresholds that could result in TTS or the onset of PTS.

*Comment 10:* FoA noted that NMFS did not evaluate cumulative impacts as part of its analysis. CBD/HSUS also urged NMFS to conduct an analysis of cumulative effects of construction and operation of the Anchorage Port Modernization Project (APMP).

*Response:* Neither the MMPA nor NMFS' implementing regulations specify how to consider other activities and their impacts on the same populations when conducting a negligible impact analysis. However, consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into the negligible impact analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the density/distribution and status of the species, population size and growth rate, and ambient noise).

In addition, cumulative effects were addressed in the EA and Biological Opinion prepared for this action. The APMP is specifically considered in the cumulative effects section of the EA. These documents, as well as the Alaska Marine Stock Assessments and the most recent abundance estimate for Cook Inlet beluga whales (Shelden *et al.*, 2015) are part of NMFS' Administrative Record for this action, and provided the decision maker with information regarding other activities in the action area that affect marine mammals, an analysis of cumulative impacts, and other information relevant to the determination made under the MMPA.

*Comment 11:* FoA commented that issuing the IHA would violate the Endangered Species Act as a permit (IHA) cannot be issued if taking will appreciably reduce the likelihood

of survival and recovery of the species in the wild. Additionally, FoA believes that mitigation of noise and other impacts do not go far enough to fully protect the Cook Inlet beluga whales from the many threats facing them.

*Response:* NMFS' Biological Opinion concluded that the issuance of an IHA is not likely to jeopardize the continued existence of the Cook Inlet beluga whales or destroy or adversely modify Cook Inlet beluga whale critical habitat. NMFS has revised its IHA requirements to require shutdown upon observation of one beluga whale within or approaching the area expected to contain sound exceeding NMFS' criteria for Level B harassment. See response to comment #8. NMFS acknowledges the difficulties of monitoring in the field, particularly at long distances. However, NMFS believes the required mitigation and related monitoring satisfy the requirements of the MMPA.

*Comment 12:* FoA stated that issuing the IHA would violate NEPA as NMFS did not prepare an EIS.

*Response:* The purpose of an EA is to evaluate the environmental impacts of an action and determine if a proposed action or its alternatives have potentially significant environmental effects. The EA process concludes with either a Finding of No Significant Impact or a determination to prepare an Environmental Impact Statement. NMFS issued a Finding of No Significant Impact (FONSI) detailing the reasons why the agency has determined that the action will have no significant impacts.

*Comment 13:* FoA commented that NMFS must include a discussion of ethics and the rights of wildlife when assessing the potential harassment of marine life.

*Response:* NMFS' does not have authority under section 101(a)(5)(D) of the MMPA to consider these issues in making a decision. As enacted by Congress, our only authority under



that provision is to evaluate the specified activity to determine if it will have a negligible impact on the affected species or stocks and no unmitigable adverse impact on marine mammal availability for relevant subsistence uses. If those standards are met and the expected take is limited to small numbers of marine mammals, NMFS must issue an IHA that contains the required mitigation, monitoring, and reporting requirements.

*Comment 14:* CBD/HSUS recommended that NMFS issue and finalize a draft recovery plan as is required under the Endangered Species Act (ESA) and not issue an IHA until this has occurred.

*Response:* The Cook Inlet Beluga Whale Recovery Plan is currently under development and NMFS is working towards its completion. A final recovery plan is not required for issuance of the IHA.

*Comment 15:* CBD/HSUS urged NMFS not to issue an IHA until the agency adopts a comprehensive monitoring plan.

*Response:* The commenter did not explain what it meant by “comprehensive monitoring plan.” However, NMFS has conducted aerial monitoring surveys of beluga whales in Cook Inlet on an annual basis since 1993 and this monitoring is likely to continue in the foreseeable future. Furthermore, an important component of the Draft Cook Inlet Beluga Whale Recovery Plan includes comprehensive population monitoring. Under the draft recovery plan, NMFS would continue to conduct aerial and photo-identification surveys to estimate abundance, and analyze population trends, calving rates, and distribution.

*Comment 16:* CBD/HSUS argue that NMFS improperly estimated take by using data from only summer months when the IHA is authorized for a one-year period. CBD/HSUS also

allege that NMFS underestimated the size of the group factor which was included in the final take estimation.

*Response:* The predictive beluga habitat model described in Goetz *et al.* 2012 was used by POA and NMFS to estimate density. This is considered to be the best information available, and incorporates National Marine Mammal Laboratory data collected during the months of June and July between 1994 and 2008. There is no data of similar quality available for the spring and early summer time frame. The authorized take estimates for the Test Pile Program were based on the assumption that pile-driving operations would take place between April 1 and July 1, 2016 and that beluga density outside the June-July period would be lower. Therefore, NMFS considers the use of the Goetz *et al.* 2012 summer data to estimate take for the April 1 through July 1 period to be conservative and appropriate.

The section on *Estimated Take by Incidental Harassment* later in this document explains why the density data used for estimating potential beluga exposures does not fully reflect the nature of local beluga occurrence and also provides a statistically defensible justification for the size of the large group factor which was selected by NMFS. Note that while larger groups of beluga whales have frequently been observed in Cook Inlet, NMFS' finding is based on groups that were actually observed near POA.

*Comment 17:* CBD/HSUS stated that it is inappropriate for NMFS to use the current, outdated, generic sound thresholds of 180 dB and 160/120dB levels (impact/non-impact) as thresholds for Level A and Level B harassment when it has already developed a more appropriate method. As such, the agency should not issue IHAs until it has completed its revision of acoustic thresholds for Level B take.

*Response:* NMFS currently uses 160 dB root mean square (rms) as the exposure level for estimating Level B harassment takes from impulse sounds for most species in most cases. This threshold was established for underwater impulse sound sources based on measured avoidance responses observed in whales in the wild. Specifically, the 160 dB threshold was derived from data for mother-calf pairs of migrating gray whales (Malme *et al.*, 1983, 1984) and bowhead whales (Richardson *et al.*, 1985, 1986) responding to seismic airguns (*e.g.*, impulsive sound source). We acknowledge there is more recent information bearing on behavioral reactions to seismic airguns, but those data only illustrate how complex and context-dependent the relationship is between the two. The 120 dB re 1  $\mu$ Pa (rms) threshold for noise originates from research on baleen whales, specifically migrating gray whales (Malme *et al.* 1984; predicted 50% probability of avoidance) and bowhead whales reacting when exposed to industrial ( *i.e.*, drilling and dredging) activities (non-impulsive sound source) (Richardson *et al.* 1990). NMFS is working to develop guidance to help determine Level B harassment thresholds. Note, however, it is not a matter of merely replacing the existing threshold with a new one. Due to the complexity of the task, any guidance will require a rigorous review that includes internal agency review, public notice and comment, and additional external peer review before any final product is published. In the meantime, and taking into consideration the facts and available science, NMFS determined it is reasonable to use the 160 dB threshold for impact sources for estimating takes of marine mammals in Cook Inlet by Level B harassment and the 120 dB threshold for vibratory sources.

With regard to injury, NMFS is developing *Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing*. Specifically, it will identify the received levels, or acoustic thresholds, above which individual marine mammals are predicted to

experience changes in their hearing sensitivity (either temporary or permanent) for acute exposure to underwater anthropogenic sound sources. That Guidance is undergoing an extensive process involving peer review and public comment, and is expected to be finalized sometime in 2016. See 80 FR 45642 (July 31, 2015).

#### *Description of Marine Mammals in the Area of the Specified Activity*

There are five marine mammal species known to occur in the vicinity of the project area. These are the Cook Inlet beluga whale, killer whale, Steller sea lion, harbor porpoise, and harbor seal.

We reviewed POA's detailed species descriptions, including life history information, for accuracy and completeness and refer the reader to Section 3 of POA's application as well as our notice of proposed IHA published in the **Federal Register** (80 FR 78176; December 16, 2015) instead of reprinting the information here. Please also refer to NMFS' website ([www.nmfs.noaa.gov/pr/species/mammals](http://www.nmfs.noaa.gov/pr/species/mammals)) for generalized species accounts which provide information regarding the biology and behavior of the marine resources that occur in the vicinity of the project area.

Table 2 lists marine mammal stocks that could occur in the vicinity of the project that may be subject to harassment and summarizes key information regarding stock status and abundance. Please see NMFS' Stock Assessment Reports (SAR), available at [www.nmfs.noaa.gov/pr/sars](http://www.nmfs.noaa.gov/pr/sars), for more detailed accounts of these stocks' status and abundance.

**Table 2. Marine mammals in the project area**

Species or DPS*	Abundance	Comments
Cook Inlet beluga whale ( <i>Delphinapterus leucas</i> )	312 <sup>a</sup>	Occurs in the project area. Listed as Depleted under the MMPA, Endangered under ESA.
Killer (Orca) whale ( <i>Orcinus orca</i> )	2,347 Resident 587 Transient <sup>b</sup>	Occurs rarely in the project area. No special status or ESA listing.

Harbor porpoise ( <i>Phocoena phocoena</i> )	31,046 <sup>c</sup>	Occurs occasionally in the project area. No special status or ESA listing.
Harbor seal ( <i>Phoca vitulina</i> )	27,386 <sup>d</sup>	Occurs in the project area. No special status or ESA listing.
Steller sea lion ( <i>Eumetopias jubatus</i> )	49,497 <sup>e</sup>	Occurs rarely within the project area. Listed as Depleted under the MMPA, Endangered under ESA.

\*DPS refers to distinct population segment under the ESA, and is treated as a species.

<sup>a</sup> Abundance estimate for the Cook Inlet stock. Allen and Angliss, 2015; Shelden et al., 2015.

<sup>b</sup> Abundance estimate for the Eastern North Pacific Alaska Resident stock; the estimate for the transient population is for the Gulf of Alaska, Aleutian Islands, and Bering Sea stock.

<sup>c</sup> Abundance estimate for the Gulf of Alaska stock.

<sup>d</sup> Abundance estimate for the Cook Inlet/Shelikof stock.

<sup>e</sup> Abundance estimate for the Western U.S. Stock.

Sources for populations estimates other than Cook inlet beluga whales: Allen and Angliss 2013, 2014, 2015.

### *Potential Effects of the Specified Activity on Marine Mammals*

The **Federal Register** notice of proposed authorization (80 FR 78176; December 16, 2015) provides a general background on sound relevant to the specified activity as well as a detailed description of marine mammal hearing and of the potential effects of these construction activities on marine mammals, and is not repeated here.

### *Anticipated Effects on Habitat*

We described potential impacts to marine mammal habitat in detail in our **Federal Register** notice of proposed authorization. The proposed Test Pile Program will not result in permanent impacts to habitats used by marine mammals. Pile installation may temporarily

increase turbidity resulting from suspended sediments. Any increases would be temporary, localized, and minimal. POA must comply with state water quality standards during these operations by limiting the extent of turbidity to the immediate project area. In general, turbidity associated with pile installation is localized to about a 25-foot radius around the pile (Everitt *et al.* 1980). Cetaceans are not expected to be close enough to the project site driving areas to experience effects of turbidity, and any pinnipeds will be transiting the terminal area and could avoid localized areas of turbidity. Therefore, the impact from increased turbidity levels is expected to be discountable to marine mammals. The proposed Test Pile Program will result in temporary changes in the acoustic environment. Marine mammals may experience a temporary loss of habitat because of temporarily elevated noise levels. The most likely impact to marine mammal habitat would be minor impacts to the immediate substrate during installation of piles during the proposed Test Pile Program. The Cook Inlet beluga whale is the only marine mammal species in the project area that has critical habitat designated in Cook Inlet. NMFS has characterized the relative value of four habitats as part of the management and recovery strategy in its Final Conservation Plan for the Cook Inlet beluga whale (NMFS 2008a). These are sites where beluga whales are most consistently observed, where feeding behavior has been documented, and where dense numbers of whales occur within a relatively confined area of the inlet. Type 1 Habitat is termed “High Value/High Sensitivity” and includes what NMFS believes to be the most important and sensitive areas of the Cook Inlet for beluga whales. Type 2 Habitat is termed “High Value” and includes summer feeding areas and winter habitats in waters where whales typically occur in lesser densities or in deeper waters. Type 3 Habitat occurs in the offshore areas of the mid and upper inlet and also includes wintering habitat. Type 4 Habitat describes the remaining portions of the range of these whales within Cook Inlet. The habitat that

will be directly impacted from Test Pile activities at the POA is considered Type 2 Habitat, though excluded from the critical habitat designation due to national security considerations.

Note that the amount of critical habitat impacted by the Test Pile Program is relatively small. The POA is planning to install test piles at 6 locations arranged on a roughly north-south alignment. The maximum overlap with critical habitat to the north is 1,677 acres (6.79 sq. km; 2.62 sq. mi.), and the maximum overlap to the south is 2,113 acres (8.55 sq. km; 3.3 sq. mi.), depending on pile location. The two maxima will not occur at the same time because pile installation will only take place at one pile at a time; the northern-most maximum is for the northern-most pile, and the southern-most maximum is for the southern-most pile. As pile location changes, the ensonified area on one side decreases as it increases on the other side. Pile installation in the center of the north-south alignment will ensonify the smallest area of critical habitat. The area excluded due to national security was not included in these measurements. For all pile locations, the temporarily ensonified area represents less than 1% of designated critical habitat.

Beluga whales have been observed most often in the POA area at low tide in the fall, peaking in late August to early September (Markowitz and McGuire 2007; Cornick and Saxon-Kendall 2008). Although the POA scientific monitoring studies indicate that the area is not used frequently by many beluga whales, individuals and sometimes large groups of beluga whales have been observed passing through the area when traveling between lower and upper Knik Arm. Diving and traveling have been the most common behaviors observed, with instances of confirmed feeding. However, the most likely impact to marine mammal prey from the proposed Test Pile Program will be temporary avoidance of the immediate area. In general, the nearer the animal is to the source the higher the likelihood of high energy and a resultant effect (such as

mild, moderate, mortal injury). Affected fish would represent only a small portion of food available to beluga whales in the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution, and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area will still leave significantly large areas of fish and marine mammal foraging habitat in Knik Arm. Therefore, impacts to beluga prey species are likely to be minor and temporary.

In summary, the long-term effects of any prey displacements are not expected to affect the overall fitness of the Cook Inlet beluga whale population or other affected species; effects will be minor and will terminate after cessation of the proposed Test Pile Program. Due to the short duration of the activities and the relatively small area of the habitat affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences for individual marine mammals or their populations, including Cook Inlet beluga whales.

### *Mitigation*

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, “and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking” for certain subsistence uses.

Measurements from similar pile driving events were utilized to estimate zones of influence (ZOI; see “Estimated Take by Incidental Harassment”). ZOIs are often used to establish a mitigation zone around each pile (when deemed practicable) and to identify where Level A harassment to marine mammals may occur, and also provide estimates of the areas



Level B harassment zones. ZOIs may vary between different diameter piles and types of installation methods. POA will employ the following mitigation measures, which were contained in the notice of proposed IHA with modifications as noted here:

(a) Conduct briefings between construction supervisors and crews, marine mammal monitoring team, and POA staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

(b) For in-water heavy machinery work other than pile driving (using, e.g., standard barges, tug boats, barge-mounted excavators, or clamshell equipment used to place or remove material), if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) movement of the barge to the pile location or (2) positioning of the pile on the substrate via a crane (i.e., stabbing the pile).

*Time Restrictions* - Work would occur only during daylight hours, when visual monitoring of marine mammals can be conducted.

*Establishment of Monitoring and Shutdown Zones* – Monitoring zones (ZOIs) are the areas in which SPLs would be expected to equal or exceed 160 dB rms for impact driving and 125 dB rms for vibratory driving. Note that 125 dB has been established as the appropriate isopleth for Level B harassment zone associated with vibratory driving since ambient noise levels near the POA are likely to be above 120 dB rms and this value has been used previously as a threshold in this area. Note that POA's acoustic monitoring plan includes collection of data to verify the level of background noise in the vicinity of POA. Monitoring of these zones enables observers to be aware of and communicate the presence of marine mammals in the project area.

The primary purpose of monitoring these zones is for documenting potential incidents of Level B harassment, although here we require more stringent measures associated with beluga whale occurrence in the monitoring zone (see shutdown zone, below). Nominal predicted radial distances for driving piles with and without the use of sound attenuation systems are shown in Table 3. The attenuated zones are calculated assuming 10 dB noise reduction provided by the encapsulated bubble system and adBM resonance system treatments (CalTrans, 2012; note that the resonance system is expected to provide greater attenuation than would the bubble system, making this a conservative assumption for use of that system). Test Pile Program results will provide more precise information on actual levels of attenuation attained. We discuss monitoring objectives and protocols in greater depth in “Monitoring and Reporting.”

Table 3. Distances in meters to NMFS’ Level A (injury) and Level B harassment thresholds (isopleths) for unattenuated and attenuated 48-inch-diameter pile, assuming a 125-dB background noise level

Pile diameter (inches)	Impact			Vibratory		
	Pinniped, Level A Injury	Cetacean, Level A Injury	Level B Harassment	Pinniped, Level A Injury	Cetacean, Level A Injury	Level B Harassment
	190 dB	180 dB	160 dB	190 dB	180 dB	125 dB
48, unattenuated	14 m	63 m	1,359 m	<10 m	<10 m	3,981 m
48, 10 dB Attenuation	<10 m	13 m	293 m	< 10 m	<10 m	858 m

In order to document potential incidents of harassment, monitors will record all marine mammal observations regardless of location. The observer’s location, as well as the location of the pile being driven, is known from a global positioning system (GPS). The location of the animal is estimated as a distance from the observer, which is then compared to the location from

the pile and the ZOIs for relevant activities (i.e., pile installation). This information may then be used to extrapolate observed takes to reach an approximate understanding of actual total takes, in the event that the entire monitoring zone is not visible.

*Soft Start* - The use of a soft start procedure is believed to provide additional protection to marine mammals by warning or providing a chance to leave the area prior to the hammer operating at full capacity, and typically involves a requirement to initiate sound from the hammer for 15 seconds at reduced energy followed by a waiting period. This procedure is repeated two additional times. It is difficult to specify the reduction in energy for any given hammer because of variation across drivers and, for impact hammers, the actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in “bouncing” of the hammer as it strikes the pile, resulting in multiple “strikes.” The project will utilize soft start techniques for both impact and vibratory pile driving. POA will initiate sound from vibratory hammers for fifteen seconds at reduced energy followed by a 1 minute waiting period, with the procedure repeated two additional times. For impact driving, we require an initial set of three strikes from the impact hammer at reduced energy, followed by a thirty-second waiting period, then two subsequent three strike sets. Soft start will be required at the beginning of each day’s pile driving work and at any time following a cessation of pile driving of 20 minutes or longer (specific to either vibratory or impact driving).

#### *Monitoring and Shut-down for Pile Driving*

The following measures will apply to POA:

*Shut-down Zone* – For all pile driving activities, POA will establish a shut-down zone. Shut-down zones typically correspond to the area in which SPLs equal or exceed the 180/90 dB rms acoustic injury criteria, with the purpose being to define an area within which shut-down of

activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area), thus preventing potential injury of marine mammals. For marine mammals other than beluga whales, POA, will implement a minimum shut-down zone of 100 m radius around all vibratory and impact pile activity. These precautionary measures would also further reduce the possibility of auditory injury and behavioral impacts as well as limit the unlikely possibility of injury from direct physical interaction with construction operations.

*Shut-down for Beluga Whales* – In order to provide more stringent protections for beluga whales, in-water pile driving operations will be shut down upon observation of any beluga whale within or approaching the maximum potential Level B harassment zone when driving unattenuated piles (1,400 m and 4,000 m for impact and vibratory pile driving, respectively). When driving piles with sound attenuation systems, POA will shutdown upon observation of whales within or approaching a smaller zone that NMFS expects would contain sound exceeding relevant harassment criteria (300 m and 900 m for impact and vibratory pile driving, respectively). Two of ten piles will be driven without use of sound attenuation systems. If shut down does occur, pile driving may not resume until the group is observed exiting the relevant shut down zone or until 30 minutes have passed without re-sighting.

*Visual Marine Mammal Observation* - POA will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of activity. All observers will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. POA will monitor the shut-down zone and disturbance zones before, during, and after pile driving, with observers located at the best practicable vantage points.

At all times, POA will be required to monitor the maximum predicted Level B zones, regardless of sound attenuation system used. Although the zones employed for shutdown purposes in association with driving of attenuated piles are calculated assuming a 10 dB reduction in sound pressure levels, any beluga whales observed in the larger monitoring zone will be recorded and reported as potential take, pending analysis of acoustic monitoring data.

Based on our requirements, the Marine Mammal Monitoring Plan would implement the following procedures for pile driving:

- Four MMOs will work concurrently in rotating shifts to provide full coverage for marine mammal monitoring during in-water pile installation activities for the Test Pile Program. MMOs will work in four-person teams to increase the probability of detecting marine mammals and to confirm sightings. Three MMOs will scan the Level A and Level B harassment zones surrounding pile-driving activities for marine mammals by using big eye binoculars (25X), hand-held binoculars (7X), and the naked eye. One MMO will focus on the Level A harassment zone and two others will scan the Level B zone. Four MMOs will rotate through these three active positions every 30 minutes to reduce eye strain and increase observer alertness. The fourth MMO will record data on the computer, a less-strenuous activity that will provide the opportunity for some rest. A theodolite will also be available for use.
- In order to more effectively monitor the maximum potential Level B harassment zone associated with vibratory pile driving (i.e., 4,000 m), personnel stationed on the hydroacoustic vessels will keep watch for marine mammals that may approach or enter that zone and will communicate all sightings to land-based MMOs and other appropriate shore staff.

- Before the Test Pile Program commences, MMOs and POA authorities will meet to determine the most appropriate observation platform(s) for monitoring during pile driving. Considerations will include:
  - Height of the observation platform, to maximize field of view and distance
  - Ability to see the shoreline, along which beluga whales commonly travel
  - Safety of the MMOs, construction crews, and other people present at the POA
  - Minimizing interference with POA activities

Height and location of an observation platform are critical to ensuring that MMOs can adequately observe the harassment zone during pile installation. The platform should be mobile and able to be relocated to maintain maximal viewing conditions as the construction site shifts along the waterfront. Past monitoring efforts at the POA took place from a platform built on top of a cargo container or a platform raised by an industrial scissor lift. A similar shore-based, raised, mobile observation platform will likely be used for the Test Pile Program.

- POA will be required to monitor the maximum potential Level B harassment zones (1,400 and 4,000 m for impact and vibratory pile driving, respectively).
- MMOs will begin observing for marine mammals within the Level A and Level B harassment zones for 30 minutes before “the soft start” begins. If a marine mammal(s) is present within the relevant shut-down zone prior to the “soft start” or if marine mammal occurs during “soft start” pile driving will be delayed until the animal(s) leaves the shut-down zone. Pile driving will resume only after the MMOs have determined, through sighting or after 30 minutes with no sighting, that the animal(s) has moved outside the

shut-down zone. After 30 minutes, when the MMOs are certain that the shut-down zone is clear of marine mammals, they will authorize the soft start to begin.

- If a marine mammal other than a beluga whale is traveling along a trajectory that could take it into the maximum potential Level B harassment zone, the MMO will record the marine mammal(s) as a “take” upon entering that zone. While the animal remains within the Level B harassment zone, that pile segment will be completed without cessation, unless the animal approaches the 100-meter shut-down zone, at which point the MMO will authorize the immediate shut-down of in-water pile driving before the marine mammal enters the shut-down zone. Pile driving will resume only once the animal has left the shut-down zone on its own or has not been resighted for a period of 30 minutes.
- If waters exceed a sea-state which restricts the observers’ ability to make observations within the relevant marine mammal shut-down zone (e.g. excessive wind or fog), pile installation will cease until conditions allow the resumption of monitoring.
- The waters will be scanned 30 minutes prior to commencing pile driving at the beginning of each day, and prior to commencing pile driving after any stoppage of 30 minutes or greater. If marine mammals enter or are observed within the designated marine mammal shutdown zone during or 30 minutes prior to pile driving, the monitors will notify the on-site construction manager to not begin until the animal has moved outside the designated radius.
- The waters will continue to be scanned for at least 30 minutes after pile driving has completed each day.

#### *Mitigation Conclusions*

NMFS has carefully evaluated the applicant's proposed mitigation measures and considered a range of other measures in the context of ensuring that NMFS prescribes the means of effecting the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another:

- The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals
- The proven or likely efficacy of the specific measure to minimize adverse impacts as planned
- The practicability of the measure for applicant implementation.

Any mitigation measure(s) prescribed by NMFS should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

1. Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).
2. A reduction in the numbers of marine mammals (total number or number at biologically important time or location) exposed to received levels of pile driving, or other activities expected to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).
3. A reduction in the number of times (total number or number at biologically important time or location) individuals would be exposed to received levels of pile driving, or other activities expected to result in the take of marine



mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

4. A reduction in the intensity of exposures (either total number or number at biologically important time or location) to received levels of pile driving, or other activities expected to result in the take of marine mammals (this goal may contribute to a, above, or to reducing the severity of harassment takes only).
5. Avoidance or minimization of adverse effects to marine mammal habitat, paying special attention to the food base, activities that block or limit passage to or from biologically important areas, permanent destruction of habitat, or temporary destruction/disturbance of habitat during a biologically important time.
6. For monitoring directly related to mitigation – an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, our determination is that the mitigation measures provide the means of effecting the least practicable impact on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

### **Monitoring and Reporting**

In order to issue an ITA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth "requirements pertaining to the monitoring and reporting of such taking." The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for ITAs

must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area.

POA submitted a marine mammal monitoring plan as part of the IHA application. It can be found at <http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm>.

Monitoring measures prescribed by NMFS should accomplish one or more of the following general goals:

1. An increase in the probability of detecting marine mammals, both within the mitigation zone (thus allowing for more effective implementation of the mitigation) and in general to generate more data to contribute to the analyses mentioned below;
2. An increase in our understanding of how many marine mammals are likely to be exposed to levels of pile driving that we associate with specific adverse effects, such as behavioral harassment, TTS, or PTS;
3. An increase in our understanding of how marine mammals respond to stimuli expected to result in take and how anticipated adverse effects on individuals (in different ways and to varying degrees) may impact the population, species, or stock (specifically through effects on annual rates of recruitment or survival) through any of the following methods:
  - Behavioral observations in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict received level, distance from source, and other pertinent information);
  - Physiological measurements in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict received level, distance from source, and other pertinent information);

- Distribution and/or abundance comparisons in times or areas with concentrated stimuli versus times or areas without stimuli;
- 4. An increased knowledge of the affected species; and
- 5. An increase in our understanding of the effectiveness of certain mitigation and monitoring measures.

### *Acoustic Monitoring*

The POA has developed an acoustic monitoring plan titled *Anchorage Port Modernization Project Test Pile Program Draft Hydroacoustic Monitoring Framework*. Specific details regarding the plan may be found at [www.nmfs.noaa.gov/pr/permits/incidental/construction.htm](http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm). POA will conduct acoustic monitoring for impact pile driving to determine the actual distances to the 190 dB re 1μPa rms, 180 dB re 1μPa rms, and 160 dB re 1μPa rms isopleths, which are used by NMFS to define the Level A injury and Level B harassment zones for pinnipeds and cetaceans for impact pile driving. The POA will also measure background noise levels in the absence of pile driving activity and will conduct acoustic monitoring for vibratory pile driving to determine the actual distance to the point at which the signal becomes indistinguishable from background sound levels (assuming these are greater than 120 dB). Encapsulated bubble curtains and resonance-based attenuation systems will be tested during installation of some piles to determine their relative effectiveness at attenuating underwater noise.

A typical daily sequence of operations for an acoustic monitoring day will include the following activities:

- Discussion of the day's pile-driving plans with the crew chief or appropriate contact and determination of setup locations for the fixed positions. Considerations include the piles to be driven and anticipated barge movements during the day.

- Calibration of hydrophones.
- Setup of the near (10-meter) system either on the barge or the existing dock.
- Deployment of an autonomous or cabled hydrophone at one of the distant locations.
- Recording pile driving operational conditions throughout the day.
- Upon conclusion of the day's pile driving, retrieve the remote systems, post- calibrate all the systems, and download all systems.
- A stationary hydrophone recording system used to determine SSLs will be suspended either from the pile driving barge or existing docks at approximately 10 meters from the pile being driven, for each pile driven. These data will be monitored in real-time.
- Prior to monitoring, a standard depth sounder will record depth before pile driving commences. The sounder will be turned off prior to pile driving to avoid interference with acoustic monitoring. Once the monitoring has been completed, the water depth will be recorded.
- A far range hydrophone will be located at a distance no less than 20 times the source water depth from the pile driving activity outside of the active shipping lanes/dredge area. If possible, this hydrophone should be moored using the same anchoring equipment and in the same location as was used for the background noise monitoring. In this situation, the hydrophone would be located between 500 and 1,000 meters (1,640 – 3,280 feet) from the indicator test piles, which is sufficiently greater than 20 times the source water depth. This hydrophone will also be located in waters greater than 10 meters (33 feet) deep and avoid areas of irregular bathymetry. The hydrophone will be placed within a few meters of the bottom in order to reduce flow noise avoid areas of irregular

bathymetry. The hydrophone will be placed within a few meters of the bottom in order to reduce flow noise

*Vessel-based Hydrophones (One to Two Locations):*

- An acoustic vessel with a single-channel hydrophone will be in the Knik Arm open water environment to monitor near-field and real-time isopleths for marine mammals (Figure 13-1, Figure 13-4 in Application).
- Continuous measurements will be made using a sound level meter.
- One or two acoustic vessels are proposed to deploy hydrophones that will be used to collect data to estimate the distance to far-field sound levels (i.e., the 120-125-dB zone for vibratory and 160-dB zone for impact driving).
- During the vessel-based recordings, the engine and any depth finders must be turned off. The vessel must be silent and drifting during spot recordings.
- Either a weighted tape measure or an electronic depth finder will be used to determine the depth of the water before measurement and upon completion of measurements. A GPS unit or range finder will be used to determine the distance of the measurement site to the piles being driven.
- Prior to and during the pile-driving activity, environmental data will be gathered, such as water depth and tidal level, wave height, and other factors, that could contribute to influencing the underwater sound levels (e.g., aircraft, boats, etc.). Start and stop time of each pile-driving event and the time at which the bubble curtain is turned on and off will be logged.

- The construction contractor will provide relevant information, in writing, to the hydroacoustic monitoring contractor for inclusion in the final monitoring report:

#### *Data Collection*

MMOs will use approved data forms. Among other pieces of information, POA will record detailed information about any implementation of shut-downs, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. In addition, POA will attempt to distinguish between the number of individual animals taken and the number of incidents of take. At a minimum, the following information would be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (e.g., percent cover, visibility);
- Water conditions (e.g., sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Locations of all marine mammal observations; and
- Other human activity in the area.

#### *Ambient Noise*

Ambient noise will be collected according to the NMFS' guidance memorandum issued

on January 31, 2012, titled *Data Collection Methods to Characterize Underwater Background Sound Relevant to Marine Mammals in Coastal Nearshore Waters and Rivers of Washington and Oregon* (NMFS 2012). This guidance is considered to be generally applicable for marine conditions and hydroacoustic monitoring in Alaska.

### *Reporting*

POA will notify NMFS prior to the initiation of the pile driving activities and will provide NMFS with a draft monitoring report within 90 days of the conclusion of the proposed construction work or 60 days prior to the start of additional work covered under a subsequent IHA or Letter of Authorization. This report will detail the monitoring protocol, summarize the data recorded during monitoring, and estimate the number of marine mammals that may have been harassed. If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report must be submitted within 30 days after receipt of comments.

### **Estimated Take by Incidental Harassment**

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as: “...any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].”

Given the many uncertainties in predicting the quantity and types of impacts of sound in every given situation on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular

level of sound, based on the available science. The method used for calculating potential exposures to impact and vibratory pile driving noise for each threshold was estimated using a habitat-based predictive density model (Goetz et al., 2012) and local marine mammal data sets.

#### *Harbor Seal and Harbor Porpoise*

Estimated take for harbor seals and harbor porpoises was modified from the levels published in the **Federal Register** notice of proposed authorization. This change was based on discussion with the Marine Mammal Commission. NMFS had originally proposed 31 harbor seal takes and 37 harbor porpoise takes. The Commission felt that there was a strong likelihood that more harbor seals would be taken compared to harbor porpoises. NMFS had estimated that one animal of each species would be taken per day resulting in 31 per species. NMFS also added 6 take for harbor porpoises as a contingency since these animals are known to travel in pods.

NMFS acknowledges that takes for various species can be estimated through a variety of methodologies. NMFS re-calculated take for these two species. As a conservative measure, daily individual sighting rates for any recorded year were generally used to quantify take of harbor seals and harbor porpoises for pile driving associated with the Test Pile Program. Data was collected as part of the MTRP Scientific Monitoring program, which took place from 2008 through 2011 (Cornick *et al.* 2008, 2009, 2010, 2011).

The following equation was used to estimate harbor seal and harbor porpoise exposures

Exposure estimate = (N) \* # days of pile driving per site, where:

N = highest daily abundance estimate for each species in project area.

For harbor porpoises there was only a single sighting of more than one animal so NMFS opted to use a daily abundance rate of one for a total authorized take of 31. For harbor seals



there were several reports of two or more animals. Therefore, NMFS applied a daily abundance estimate of two for a total authorized take of 62.

### *Steller Sea Lion*

There were three sightings of a single Steller sea lion during construction at the POA in 2009, and it is not possible to determine whether it was one or more animals. Alaska marine waters, including Cook Inlet, are undergoing environmental changes that are correlated with changes in movements of animals, including marine mammals, into expanded or contracted ranges. For example, harbor seals and harbor porpoises are increasing in numbers in Upper Cook Inlet. It is unknown at this time what the impacts of environmental change will be on Steller sea lion movements, but it is possible that Steller sea lions may be sighted more frequently in Upper Cook Inlet, which is generally considered outside their typical range. The Steller sea lions sightings at the POA in 2009 indicate that this species can and does occur in Upper Cook Inlet. As such, NMFS proposed an encounter rate of 1 individual for every 5 pile driving days across 31 driving days in the proposed authorization published in the **Federal Register**. Furthermore, Steller sea lions are social animals and often travel in groups, and a single sighting could include more than one individual. Therefore, NMFS conservatively estimates that six Steller sea lions could to be observed at the POA during the proposed timeframe of the Test Pile Program.

### *Killer Whales*

No killer whales were sighted during previous monitoring programs for the Knik Arm Crossing and POA construction projects, based on a review of monitoring reports. The infrequent sightings of killer whales that are reported in upper Cook Inlet tend to occur when their primary prey (anadromous fish for resident killer whales and beluga whales for transient killer whales) are also in the area (Shelden *et al.* 2003).

With in-water pile driving occurring for only about 27 hours over 31 days, the potential for exposure within the Level B harassment isopleths is anticipated to be extremely low. Level B take is conservatively estimated at no more than 8 killer whales, or two small pods, for the duration of the Test Pile Program.

### *Cook Inlet Beluga Whale*

For beluga whales, aerial surveys of Cook Inlet were completed in June and July from 1994 through 2008 (Goetz *et al.* 2012). Data from these aerial surveys were used along with depth soundings, coastal substrate type, an environmental sensitivity index, an index of anthropogenic disturbance, and information on anadromous fish streams to develop a predictive beluga whale habitat model (Goetz *et al.* 2012)

Three different beluga distribution maps were produced from the habitat model based on sightings of beluga whales during aerial surveys. First, the probability of beluga whale presence was mapped using a binomial (i.e., yes or no) distribution and the results ranged from 0.00 to 0.01. Second, the expected group size was mapped. Group size followed a Poisson distribution, which ranged from 1 to 232 individuals in a group. Third, the product (i.e., multiplication) of these predictive models produced an expected density model, with beluga whale densities ranging from 0 to 1.12 beluga whales/km<sup>2</sup>. From this model Goetz *et al.* (2012) developed a raster GIS dataset, which provides a predicted density of beluga whales throughout Cook Inlet at a scale of one square kilometer. Habitat maps for beluga whale presence, group size, and density (beluga whales/km<sup>2</sup>) were produced from these data and resulting model, including a raster Geographic Information System data set, which provides a predicted density of beluga whales throughout Cook Inlet at a 1-km<sup>2</sup>-scale grid.

The numbers of beluga whales potentially exposed to noise levels above the Level B harassment thresholds for impact (160 dB) and vibratory (125 dB) pile driving were estimated using the following formula:

Beluga Exposure Estimate =  $N * \text{Area} * \text{number of days of pile driving}$ , where:

$N$  = maximum predicted # of belugas whales/km<sup>2</sup>

Area = Area of Isopleth (area in km<sup>2</sup> within the 160-dB isopleth for impact pile driving, or area in km<sup>2</sup> within the 125-dB isopleth for vibratory pile driving)

The distances to the Level B harassment and Level A injury isopleths were used to estimate the areas of the Level B harassment and Level A injury zones associated with driving a 48-inch pile, without consideration of potential effectiveness of sound attenuation systems. Note that ambient noise is likely elevated in the area, and 125 dB is used as a proxy for the background sound level. Distances and areas were calculated for both vibratory and impact pile driving, and for cetaceans and pinnipeds. Geographic information system software was used to map the Level B harassment and Level A injury isopleths from each of the six indicator test pile locations. Land masses near the POA, including Cairn Point, the North Extension, and Port MacKenzie, act as barriers to underwater noise and prevent further spread of sound pressure waves. As such, the harassment zones for each threshold were truncated and modified with consideration of these impediments to sound transmission (See Figures 6-1 through 6-6 in the Application). The measured areas (Table 6) were then used in take calculations for beluga whales.

Table 4. Areas of the Level A and Level B harassment zones\*

	Impact			Vibratory		
	Pinniped, Level A	Cetacean, Level A	Level B	Pinniped, Level A	Cetacean, Level A	Pinniped, Level B
Indicator Teste Piles	190 dB	180 dB	160 dB	190 dB	180 dB	125 dB
Piles 3,4	<0.01 km <sup>2</sup>	<0.01 km <sup>2</sup>	2.24 km <sup>2</sup>	0 km <sup>2</sup>	0 km <sup>2</sup>	15.54 km <sup>2</sup>
Pile 1			2.71 km <sup>2</sup>			19.54 km <sup>2</sup>
Pile 2			2.76 km <sup>2</sup>			20.08 km <sup>2</sup>
Pile 5,6			2.79 km <sup>2</sup>			20.90 km <sup>2</sup>
Pile 7			2.80 km <sup>2</sup>			20.95 km <sup>2</sup>
Piles 8,9,10			3.03 km <sup>2</sup>			22.14 km <sup>2</sup>

\*Based on the distances to sound isopleths for a 48-inch-diameter pile, assuming a 125-dB background noise level

The beluga whale exposure estimate was calculated for each of the six indicator test pile locations separately, because the area of each isopleth was different for each location. The predicted beluga whale density raster (Goetz *et al.* 2012) was overlaid with the isopleth areas for each of the indicator test pile locations. The maximum predicted beluga whale density within each area of isopleth was then used to calculate the beluga whale exposure estimate for each of the indicator test pile locations. The maximum density values ranged from 0.031 to 0.063 beluga whale/km<sup>2</sup> (Table 5).

In the **Federal Register** Notice of proposed authorization, NMFS calculated an incorrect number of driving days at 43.5, which assumed that impact driving would occur on 12.5 days and vibratory could occur on 31 days. Impact and vibratory driving, however, will occur on a total of only 31 days. NMFS summed fractions of takes across days equaling a total of 19.245 takes which was rounded up to 20. NMFS also rounded the large group factor of 11.1 up to 12 resulting in a preliminary take estimate of 32 beluga whales. However, based on discussion with the Commission, NMFS revised the take estimates to reflect standard rounding practices (as

typically used by NMFS in estimating potential marine mammal exposures to sound) to arrive at a number of whole animals likely to be exposed per day.

In the revised take estimate, the area values were multiplied by the maximum predicted densities for both impact and vibratory driving as was done in the **Federal Register** Notice of proposed authorization. The impact driving takes per day values were all well below one (see Table 5). Employing standard rounding practices for this final IHA would result in zero takes from impact driving. However, we recognize that there is some non-zero probability of exposure of beluga whales due specifically to impact pile driving and, given that there are a total of 18.5 days of impact pile driving possible, we believe that a conservative estimate of 2 beluga takes during the days of impact driving is reasonable.

Using standard rounding procedures, we estimate that there would be one beluga whale exposed per day of vibratory driving (see Table 4). When considering the projected number of days of vibratory pile driving including a 25 percent contingency for work delays (i.e., 12.5 total days of vibratory driving), we estimate 13 takes from vibratory driving. The takes from impact driving per pile were added to the takes per pile from vibratory driving resulting in an estimated 15 beluga whale takes. Results are shown in Table 5.

**Table 5. Estimated Cook Inlet Beluga Whale Takes.**

Pile #	Impact pile driving area (km <sup>2</sup> )	Impact driving max density (whales/ km <sup>2</sup> )	Takes per day impact driving/ Rounded Takes	Vibratory pile driving area (km <sup>2</sup> )	Vibratory driving max density (whales/ km <sup>2</sup> )	Takes per day vibratory driving/ Rounded Takes
Pile 3	2.24	0.031	0.07/0	15.54	0.056	0.87/1
Pile 4	2.24	0.031	0.07/0	15.54	0.056	0.87/1
Pile 1	2.71	0.042	0.11/0	19.54	0.063	1.23/1

Pile 2	2.76	0.038	0.10/0	20.08	0.062	1.24/1
Pile 5	2.79	0.062	0.17/0	20.9	0.062	1.30/1
Pile 6	2.79	0.062	0.17/0	20.9	0.062	1.30/1
Pile 7	2.8	0.062	0.17/0	20.95	0.062	1.30/1
Pile 8	3.03	0.042	0.13/0	22.14	0.063	1.39/1
Pile 9	3.03	0.042	0.13/0	22.14	0.063	1.39/1
Pile 10	3.03	0.042	0.13/0	22.14	0.063	1.39/1
Total Rounded Takes (assume 18.5 days of impact pile driving)			0	Total Rounded Takes (assume 12.5 days of vibratory pile driving)		12.5
Total Takes			2*	Total Rounded Takes		13
Total Takes From Impact And Vibratory Driving						15

\*Note that takes per day from impact driving rounded down to zero. NMFS acknowledges the risk of take is greater than zero and as a contingency estimated two total takes from impact pile driving.

The beluga density estimate used for estimating potential beluga exposures does not reflect the reality that beluga whales can travel in large groups. As a contingency that a large group of beluga whales could potentially occur in the project area, NMFS buffered the exposure estimate detailed in the preceding by adding the estimated size of a notional large group of beluga whales. Incorporation of large groups into the beluga whale exposure estimate is intended to reflect the possibility that whales could be exposed to behavioral harassment based on what is known about belugas' tendency to travel together in pods. A single large group has been added to the estimate of exposure for beluga whales based on the density method, in the anticipation that the entry of a large group of beluga whales into a Level B harassment zone would take place, at most, one time during the project. To determine the most appropriate size of a large group, two sets of data were examined: (1) Beluga whale sightings collected opportunistically by POA employees since 2008 and (2) Alaska Pacific University (APU) scientific monitoring that occurred from 2007 through 2011.

The APU scientific monitoring data set documents 390 beluga whale sightings. Group size exhibits a mode of 1 and a median of 2, indicating that over half of the beluga groups observed over the 5-year span of the monitoring program were of individual beluga whales or groups of 2. As expected, the opportunistic sighting data from the POA do not reflect this preponderance of small groups. The POA opportunistic data do indicate, however, that large groups of belugas were regularly seen in the area over the past 7 years, and that group sizes ranged as high as 100 whales. Of the 131 sightings documented in the POA opportunistic data set, 48 groups were of 15 or more beluga whales.

The 95th percentile of group size for the APU scientific monitoring data is 11.1 beluga whales, rounded down to 11 beluga whales. In the **Federal Register** Notice of proposed authorization, the value was erroneously rounded up to 12. This means that, of the 390 documented beluga whale groups in this data set, 95 percent consisted of fewer than 11.1 whales; 5 percent of the groups consisted of more than 11.1 whales. Therefore, it is improbable that a group of more than 11 beluga whales would occur during the Test Pile Program. This number balances reduced risk to the POA with protection of beluga whales. POA opportunistic observations indicate that many groups of greater than 11 beluga whales commonly transit through the project area. APU scientific monitoring data indicate that 5 percent of their documented groups consisted of greater than 11 beluga whales.

The total number of estimated and authorized takes of Cook Inlet beluga whales is, therefore, 15 (13 vibratory/2 impact driving) using the density method plus 11 based on the large group adjustment, resulting in 26 total incidents of take. No Level A harassment is expected or authorized.

Note that this take estimate and authorization is based on the maximum predicted zone of influence (i.e., 1,359 m and 3,981 m for impact and vibratory driving, respectively). This is a precautionary approach accounting for the possibility that the sound attenuation systems used may not always achieve effective attenuation of at least 10 dB.

## **Analyses and Determinations**

### *Negligible Impact Analysis*

Negligible impact is “an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival” (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (i.e., population-level effects). An estimate of the number of Level B harassment takes, alone, is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through behavioral harassment, NMFS must consider other factors, such as the likely nature of any responses (their intensity, duration, etc.), the context of any responses (critical reproductive time or location, migration, etc.), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, effects on habitat, and the status of the species.

To avoid repetition, the discussion of our analyses applies to all the species listed in Table 6, given that the anticipated effects of this pile driving project on marine mammals are expected to be relatively similar in nature. Except for beluga whales, where we provide additional discussion, there is no information about the size, status, or structure of any species or



stock that would lead to a different analysis for this activity; otherwise species-specific factors would be identified and analyzed.

Pile driving activities associated with the Test Pile Program, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from underwater sounds generated from pile driving. Harassment takes could occur if individuals of these species are present in the ensonified zone when pile driving is happening.

No injury, serious injury, or mortality is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. The potential for these outcomes is minimized through the implementation of the following planned mitigation measures. POA will employ a “soft start” when initiating driving activities. Given sufficient “notice” through use of soft start, marine mammals are expected to move away from a pile driving source. The likelihood of marine mammal detection ability by trained observers is high under the environmental conditions described for waters within a 1,000 meter distance of the project area. This enables reasonable certainty of the implementation of required shut-downs to avoid potential injury of marine mammals other than beluga whales and to minimize potential harassment of beluga whales for the majority of driven piles. POA’s proposed activities are localized and of relatively short duration. The total amount of time spent pile driving, including a 25% contingency, will be 27 hours over approximately 31 days.

These localized and short-term noise exposures may cause brief startle reactions or short-term behavioral modification by the animals. These reactions and behavioral changes are expected to subside quickly when the exposures cease.

The project is not expected to have significant adverse effects on affected marine mammals' habitat, as analyzed in detail in the “Anticipated Effects on Marine Mammal Habitat” section. No important feeding and/or reproductive areas for marine mammals other than beluga whales are known to be near the proposed project area. Project-related activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

Beluga whales have been observed transiting past the POA project by both scientific and opportunistic surveys. During the spring and summer when the Test Pile Program is scheduled, belugas are generally concentrated near warmer river mouths where prey availability is high and predator occurrence is low (Moore *et al.* 2000). Data on beluga whale sighting rates, grouping, behavior, and movement indicate that the POA is a relatively low-use area, occasionally visited by lone whales or small groups of whales. They are observed most often at low tide in the fall, peaking in late August to early September. Groups with calves have been observed to enter the POA area, but data do not suggest that the area is an important nursery area. Although POA scientific monitoring studies indicate that the area is not used frequently by many beluga whales, it is apparently used for foraging habitat by whales traveling between lower and upper Knik Arm, as individuals and groups of beluga whales have been observed passing through the area each year during monitoring efforts. Data collected annually during monitoring efforts demonstrated that few beluga whales were observed in July and early August; numbers of sightings increased in mid-August, with the highest numbers observed late August to mid-September. In all years, beluga whales have been observed to enter the project footprint while

construction activities were taking place, including pile driving and dredging. The most commonly observed behaviors were traveling, diving, and suspected feeding. No apparent behavioral changes or reactions to in-water construction activities were observed by either the construction or scientific observers (Cornick *et al.* 2011).

Critical habitat for Beluga whales has been identified in the area. However, habitat in the immediate vicinity of the project has been excluded from critical habitat designation. Furthermore the project activities would not modify existing marine mammal habitat. NMFS concludes that both the short-term adverse effects and the long-term effects on beluga whale prey quantity and quality will be insignificant. The sound from pile driving may interfere with whale passage between lower and upper Knik Arm. However, POA is an industrialized area with significant noise from vessel traffic and beluga whales pass through the area unimpeded.

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (e.g., Thorson and Reyff, 2006; Lerma, 2014). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. The pile removal activities analyzed here are similar to, or less impactful than, numerous construction activities conducted in other similar locations, which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment. Repeated exposures of individuals to levels of sound that may cause Level B harassment here are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some

small subset of the species is unlikely to result in any significant realized decrease in fitness for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. Impacts will be reduced to the least practicable level through use of mitigation measures described herein. Finally, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the project area while the activity is occurring.

In summary, this negligible impact analysis is founded on the following factors for beluga whales: (1) The seasonal distribution and habitat use patterns of Cook Inlet beluga whales, which suggest that for much of the time only a small portion of the population would be in the vicinity of the Test Pile Program; (2) the lack of behavioral changes observed with previous construction activities; (3) the nominal impact on critical habitat; (4) the mitigation requirements, including shut-downs for one or more belugas; (4) the monitoring requirements described earlier in this document for all marine mammal species that will further reduce the amount and intensity of takes; and (5) monitoring results from previous activities that indicated low numbers of beluga whale sightings within the Level B disturbance exclusion zone.

For marine mammals other than beluga whales the negligible impact analysis is based on the following: (1) The possibility of injury, serious injury, or mortality may reasonably be considered discountable; (2) the anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior; (3) the absence of any significant habitat within the project area, including rookeries, significant haul-outs, or known areas or features of special significance for foraging or reproduction; (4) the anticipated efficacy of the proposed mitigation measures in reducing the effects of the specified activity. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only short-term effects on individuals. The

specified activity is not expected to impact annual rates of recruitment or survival and will therefore have a negligible impact on those species.

Therefore, based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS finds that the total marine mammal take from POA's Test Pile Program will have a negligible impact on the affected marine mammal species or stocks.

**Table 6. Authorized Level B harassment take levels, DPS or stock abundance, and percentage of population proposed to be taken**

<b>DPS or Stock</b>	<b>Proposed Level B Take Harassment</b>	<b>Abundance (DPS or Stock)</b>	<b>Percentage of Population</b>
Cook Inlet beluga whale	26	312 <sup>a</sup>	8.33
Killer whale	8	2,347 Resident <sup>b</sup> 587 Transient	0.34 Resident <sup>c</sup> 1.36 Transient
Harbor porpoise	31	31,046 <sup>d</sup>	0.10
Harbor seal	62	27,836 <sup>e</sup>	0.22
Western DPS, Steller sea lion	6	49,497 <sup>f</sup>	<0.01

<sup>a</sup> Abundance estimate for the Cook Inlet stock and DPS (Allen and Angliss, 2015; Shelden et al., 2015).

<sup>b</sup> Abundance estimate for the Eastern North Pacific Alaska Resident stock; the estimate for the transient population is for the Gulf of Alaska, Aleutian Islands, and Bering Sea stock.

<sup>c</sup> Assumes all individuals would be from the resident stock or the transient stock.

<sup>d</sup> Abundance estimate for the Gulf of Alaska stock.

<sup>e</sup> Abundance estimate for the Cook Inlet/Shelikof stock.

<sup>f</sup> Abundance estimate for the Western U.S. Stock and western DPS

Sources for population estimates other than Cook Inlet beluga whales: Allen and Angliss 2013, 2014, 2015.

### *Small Numbers Analysis*

Table 6 indicates the numbers of animals that could be exposed to received noise levels that could cause Level B behavioral harassment from work associated with the proposed Test Pile Program. The analyses provided represents between <0.01% to 8.33% of the populations of these stocks that could be affected by Level B behavioral harassment. These are small numbers

of marine mammals relative to the sizes of the affected species and population stocks under consideration. Furthermore, it is possible that some beluga whale takes may represent a single individual that is counted repeatedly.

Based on the methods used to estimate take, and taking into consideration the implementation of the mitigation and monitoring measures, we find that small numbers of marine mammals will be taken relative to the populations of the affected species or stocks.

*Impact on Availability of Affected Species for Taking for Subsistence Uses*

NMFS has defined “unmitigable adverse impact” in 50 CFR 216.103 as: “an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

The proposed Test Pile Program will occur in or near a traditional subsistence hunting area and could affect the availability of marine mammals for subsistence uses. Harbor seals are the only species for which take is authorized that may be subject to limited boat-based subsistence hunting.

POA communicated with representative Native subsistence users and Tribal members to develop a Plan of Cooperation, which identifies what measures have been taken or will be taken to minimize any adverse effects of the Test Pile Program on the availability of marine mammals for subsistence uses. On December 22, 2015, POA sent letters to eight tribes including the the Kenaitze, Tyonek, Knik, Eklutna, Ninilchik, Seldovia, Salamatoff, and Chickaloon tribes

informing them of the project and identifying potential impacts to marine mammals as well as planned mitigation efforts. POA also inquired about any possible marine mammal subsistence concerns they might have. None of the tribes indicated that they had any concerns with the proposed Test Pile Program.

Since all project activities will take place within the immediate vicinity of the POA, the project will not have an adverse impact on the availability of marine mammals for subsistence use at distant locations. Due to mitigation and monitoring requirements, no displacement of marine mammals from traditional hunting areas or changes to availability of subsistence resources will result from Test Pile Program activities. Given the combination of the Test Pile Program location, small size of the affected area, and required mitigation and monitoring measures NMFS has determined that there will not be an unmitigable adverse impact on subsistence uses from POA's proposed activities.

#### *Endangered Species Act (ESA)*

The Cook Inlet beluga whale and western depleted population segment of Steller sea lion are mammal species listed as endangered under the ESA with confirmed or possible occurrence in the study area. NMFS' Permits and Conservation Division has completed a formal consultation with NMFS' Protected Resources Division under section 7 of the ESA on the issuance of an IHA to POA under section 101(a)(5)(D) of the MMPA for this activity. A Biological Opinion was issued on March 2, 2016 and is posted at <http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm>. NMFS determined that while the proposed action may affect Cook Inlet beluga whales and wDPS Steller sea lions, it is not likely to jeopardize the continued existence of those species or adversely modify any designated critical habitat.

*National Environmental Policy Act (NEPA)*

NMFS drafted a document titled *Environmental Assessment for Issuance of an Incidental Harassment Authorization to the Port of Alaska for the Take of Marine Mammals Incidental to a Test Pile Program and Finding of No Significant Impact* (FONSI). The FONSI was signed on March 2, 2016. The EA/FONSI is posted at <http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm>.

**Authorization**

As a result of these determinations, we have issued an IHA to POA for conducting the Test Pile Program in Anchorage, AK from April 1, 2016 through March 31, 2017 through provided the previously described mitigation, monitoring, and reporting requirements are incorporated.

Dated: March 9, 2016.

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Perry Gayaldo,  
Deputy Director,  
Office of Protected Resources,  
National Marine Fisheries Service.

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